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Individual Impact and Initiative in a Group Architectural Design Project

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Abstract

The purpose of this paper is to explore how designers think, and the process they use to create a design solution. To research this, the following study looks at the thought processes of an architecture student group facing a four-week long project. The project acted as an urban design/urban planning project for a first semester, senior level architectural design studio, and focused on reinvigorating Beecher Terrace within the Russel neighborhood of Louisville, KY. This study is then compared to those discussed by Nigel Cross in *Design Thinking,* which helps augment the findings of this paper's main study. The discourse of this paper is to shed light on how exactly individuals impact the solution of a design problem. Each member has a view to share and an experience to communicate, and aims to become a demonstration for design students, faculty, and professionals on how important their individual contributions to the field shape the products and spaces that are created every day.

Introduction

Design is a unique and complex field that requires problem solving skills, creativity, and experience: yet researchers really do not know what makes a good designer successful. At the core of design is a fundamental and intriguing way of thinking that every designer utilizes in his or her own way to solve a complex problem in a new and creative method. Typical design fields such as architecture and product design can often influence an entire branding campaign.

Despite the major impact that design can have on everyday life, there is relatively little research and literature on how designers think, let alone how someone can become an experienced designer. While there have been many schools of thought on what makes a designer great, there has never been a truly correct answer (Cross 29). The purpose of this paper is to

explore how designers think, and the process they use to create a design solution. To research this, the following study looks at the thought processes of an architecture student group facing a four-week long project. This study will hopefully shed light on the group's design thoughts, but also the individual's thoughts within the group. Additionally, this study will be compared to studies discussed in *Design Thinking* by Nigel Cross. This comparison will further show how each designer is unique and what experiences they bring to the overall discussion and product of the group's work.

What Makes Design So Unique?

Designers come from a wide variety of backgrounds, and perhaps the best example of this is can be found in the field of architecture. Architecture is somewhat unique in how complex the design process becomes; the bigger the project, the bigger the team. Architects coordinate with interior architects, landscape architects, engineers, etc.; all of whom help shape the design. Every person comes from various educations, institutions, and background work experience. A designer's background shapes their way of thinking; previous mentors, family upbringing, cultural upbringing, and even the size of the community a designer grew up in shapes how they design. Thus, the culmination of multiple designers cause a wide variety of backgrounds to percolate into the design process.

Design also faces a unique challenge in that it does not follow any linear path and there is no right or wrong answer. Unlike many disciplines where there is a definitive wrong answer that could cause major problems if chosen, design fields can only speculate about whether a design will work or succeed. Architecture schooling faces this with every design studio. Students spend countless hours working on a complex design to solve a spatial problem, and then encounter a

final critique by professors who question and prod to see if the design could be viable. This unique aspect to design often leads designers to create an end solution that is completely opposite to what a client or the designer wished for (Cross 10). The path to these unique and sometimes fantastic solutions however is in no way linear and often back tracts on itself. Designers research, test, fix, research some more, and sometimes even scrap an entire idea during a design process. While there are certain steps that will help a design, such as research or experimentation, much of the way a designer organizes steps is unique to that individual. In the end, it is the designer's personal experience and confidence that guides them through the process.

Individual Designers Working Within a Group

Perhaps one of the most difficult tasks a maturing architecture student or a student of any design field must face is how to learn to design collaboratively. There are many projects throughout a student's study that are individualized, where each student forms their own design and they rarely interact with the other students around them. As Nigel Cross states, "Different interpretations or understandings of the problem may become evident, and different design concepts may be favoured by different members of the team. An inevitable part of design teamwork would therefore seem to be identifying, avoiding and resolving conflicts" (Cross 93). Teamwork also requires communication, forcing designers to sketch and talk with their group members about their ideas before he/she can move forward. Time management, seniority positions, group cohesion, etc. can all act as obstacles that design groups must face in the process. So why do designers work in groups? What is so advantageous about groupwork? The obvious answer would be the ability to do more: the more designers, the more work you can get done within an amount of time. But there is a far more important part of group design that makes

it so more beneficial than individual design. As stated earlier, every designer comes from a different and unique background. As such, when you put multiple designers together, they feed off of each background and augment each other's experiences with their own. They start to bounce ideas off of each other and they alter them to mesh with all of the designers. This activity is often accomplished with peer reviews, but in a group each idea is constantly scrutinized and critiqued. Through these experiences, a group can create a more healthy and viable design solution to a problem.

Study

Recording the Study

Great effort was taken in the early stages of preparation to study the best possibilities for recording the data of the study. As this study cannot focus on empirical data collection, a way to study the design decisions and approach of the architecture students was needed in order to collect the most accurate data possible. Fortunately, research has been conducted on what are the best methods for gathering research on design activities, and several articles were consulted heavily in order to understand the best way to conduct the following research.

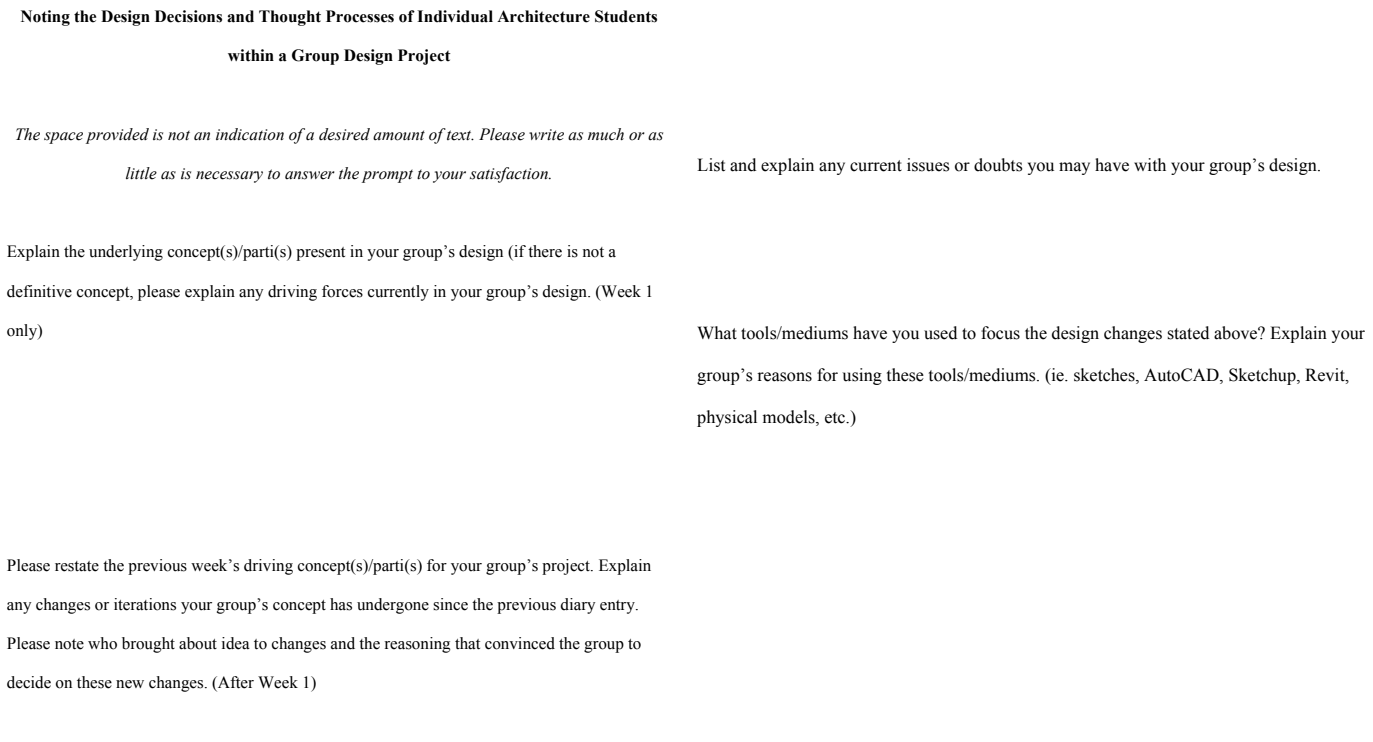
After reading these articles it was evident that the following research involving architecture students was geared towards macroscopic analysis - or researching over a greater period of time (Pedgley 467). As the focus is to find the patterns of thought and creative patterns of design students, this study was able to focus on a quarter long time frame (4-6 weeks).

However, the article by Pedgley also stressed the concerns of many researchers in how to collect data in the most unobtrusive way while also gathering accurate and timely data. He stressed the importance of gathering data at a regular rate before designers morph their view of

the original idea. As the study was conducted on active students of an architecture program, it needed to be unobtrusive to the designer while also being able to span weeks. Thus verbalization – where the designer verbally communicates what he/she is currently doing, was inefficient for the study. Pedgley's research noted that the diary method of collection – where designers recorded their thoughts and actions individually at key points in time, was one of four methods that passed the five criteria they looked for in their research. These five criteria were: designer's account of designing, solo effort, endurance, subject delimitation (or the ability to focus only on the design activity) and mobility (Pedgley 470). The author also noted that previous research conducted by A. Duncan and J. Moon, suggested that diary responses seemed to allow for more personal responses by participants, "reveal emotional responses towards circumstances, along with moments of serendipity and comments on perceived roles within social situations." Through example studies, Pedgley also demonstrates an advantage to using end-of-the-day, or a periodic diary format, over a concurrent diary format. Concurrent diary formatting requires participants to note their activities while completing them, thereby requiring the designer to stop their activities to complete it. Thus, it was decided to utilize a periodic diary in order to allow the participant to focus on design, while also collecting timely data. Augmenting this research was a study exploring the diary format used by those studying the design process. This study noted that a structured diary acted as the best formatting in order to keep designer's explanations on track.

These structured diaries included questions about their process, decisions, and reasons for making their decisions (Babapour 54).

From this research, the framework was laid for how the following study was to be conducted. This format included two major parts: a structured diary that would be distributed and then collected periodically (every week), and an accompanying visual diary or collection of their sketches, drawings, model photos, etc. during the past week. The structured diary would act as a written explanation of their work and reasoning in the past week, while the visual diary would give context to what the participants were discussing in their structured diary. Due to the nature of the research, both were completely optional to those who participated. This was in part done to make it feel less like an assignment to the students who participated, and to encourage active



Noting the Design Decisions and Thought Processes of Individual Architecture Students within a Group Design Project

The space provided is not an indication of a desired amount of text. Please write as much or as little as is necessary to answer the prompt to your satisfaction.

Explain the underlying concept(s)/parti(s) present in your group's design (if there is not a definitive concept, please explain any driving forces currently in your group's design. (Week 1 only)

Please restate the previous week's driving concept(s)/parti(s) for your group's project. Explain any changes or iterations your group's concept has undergone since the previous diary entry. Please note who brought about idea to changes and the reasoning that convinced the group to decide on these new changes. (After Week 1)

List and explain any current issues or doubts you may have with your group's design.

What tools/mediums have you used to focus the design changes stated above? Explain your group's reasons for using these tools/mediums. (ie. sketches, AutoCAD, Sketchup, Revit, physical models, etc.)

Photo 1: Structured diary developed for the study.

participation. At the very end of the project, the students were asked to provide the researcher with their final presentation drawings.

Design Parameters

The design problem for this study centered around redeveloping a lower income and crime ridden neighborhood into a mixed-income, mixed-use development. The project acted as an urban design/urban planning project for a first semester, senior level architectural design studio, and the project parameters were therefore chosen by the studio professor. Students were expected to form a design that would include single-family homes, as well as du-, tri-, and quad-apartment dwellings as well as community buildings and commercial spaces. Designs were expected to hinder criminal and drug activity from occurring on the site, while creating spaces to positively impact the economy of the neighborhood. For this studio, the site was Beecher Terrace, which lies just west of Louisville's downtown.

Timeline

The timeline of this project was roughly five weeks. During these five weeks, students were expected by the professor to present every week the changes that had been made to the project since the previous presentation. The goal that the professor had was to emphasize a need to create presentations at multiple stages of the project to show the 'client.' At the end of the five weeks was a penultimate presentation that displayed their final interpretation of the design problem.

Results

Week 1

The data collected from the group studied turned out to show a seemingly very cohesive group. Each member stated similar goals for what the group's design aimed to achieve. In the case of this group's reaction to the design project, they wished to create a better and stronger connection between the downtown Louisville area and the rest of the Russel neighborhood – the greater area that Beecher terrace resides within. However, even during the early phase of the study, the diaries show how the individual group members were approaching and thinking about the project in very different ways.

The group member's responses to the prompt on current issues/doubts about the project show how each member began looking towards what they felt they needed to be focusing on. In the case of member A, he felt that the group's 'park design' and the need to be 'integrating building types' were what was most important to the group's success in the future. However, member B's response was focused very differently; he felt the need to continue to develop their building facades was the only major worry the group needed to face going forward. The very different focuses of these two designers are influenced in part certainly by the scope of the project – about 8 city blocks, but it also demonstrates how these designers were focusing their attention within a group. Both members were focusing on distinct aspects of their design that would be impacting the residents on a daily basis. Due to the makeup of the neighborhood, parks are important to the growth of the younger residents, while the design and style of the buildings themselves are important due to their more inorganic nature. However, perhaps what is more interesting in this data is how the group is tackling the built (architecture) environment, while also trying to design the open environment of a park. Member A is taking a much broader view

of the project and looking for the layout and orientation of the building shapes, and their interaction with the greenery of the site and the primary park they hope to retain in the site. At the same time, member B is focused on taking a very detailed look at the project; an investigation of how the buildings themselves will look from the ground. When we look at the site plan and building type diagrams from the first week's presentation, we can also see how member A's focus could begin to look at park design and building types, but due to the speed of the project it was also key that at least one designer was focused on a more detailed aspect of the project.

Photo 2: Week 1 Site Plan

Photo 3: Housing Plan

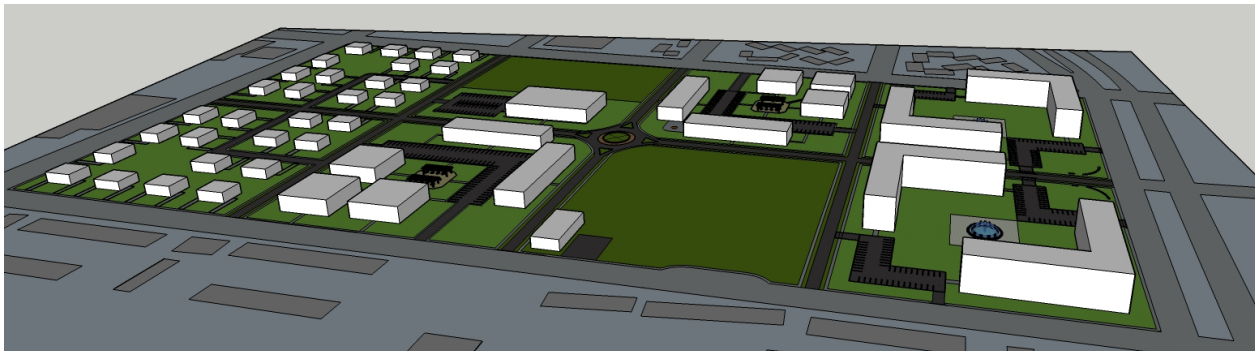


Photo 4: Perspective of early forms on the site.

Week 2

The group members responded very similarly to week 1 in how they described the group's focus up until that point. During the week, member C focused specifically on trying to integrate the housing types in a better manner in order to even out the site; this was a change that all members agreed needed work.

Additionally, each group member seemed to focus their doubts and concerns about the project differently just as they had in week 1. Interestingly, members A and B seemed to almost exchange their concerns for that of the other's. Member A stated that the group was focused on further designing the buildings and "making sure they all work together", while member B stated that the group was looking to better design the landscaping around the parks as well as further designing building facades. Earlier in the project, member A seemed to be worried about the park's design, but this focus seems to have shifted over to member B. Member C's concerns focused simply on building facades, almost bridging the gap between members A and B. So why did this flip occur?

Photo 5: Week 2 Site Plan

The visual collection of drawings from the second week gives some indication on how this may have happened. Looking at the site plan of week 2, one of the two park spaces that exist from the previous week has been roughly laid out with paths and activity spaces, while the remaining park

space lies empty. Due to the grading requirements by the studio professor, the group members were required to at some point divide this site into three parts that each student would further design and present themselves. It is likely then that these two parks were to be designed by two members. In such a case, member A has finished his broader look at the overall site and park, and subsequently turned his attention to the details of how the building may look, while member B has reversed this order and designed from detail and now faces the task of looking at how to arrange the spaces of the remaining park. Another possibility could simply have been that the task shifted from one member to another. Either way, the individual group members are once again showing how they are impacting the group's design and focus. Each individual indicates that he is focusing on designing the exterior look of the buildings through altering the façade's design, or how the exterior walls look like.

Photo 6: Site Plan with existing trees

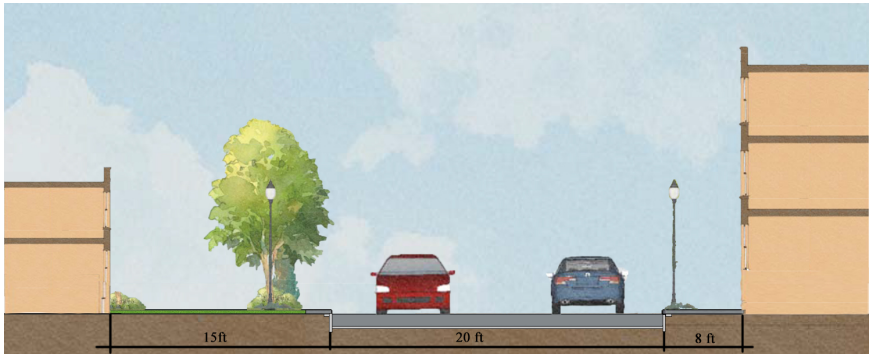


Photo 7: Section showing the design of a street within the site

Week 3

Week 3 marks the end of the recording of data. As such, the diaries from each member understandably focus on finishing presentation drawings for the final presentation at the end of the week. Member A notes that the design for the community center just south of the north park had been completed. This likely acted as the last architectural design aspect to the project that the group needed to finish. However, it is also important to note that this was not the end of the project, and that the group spent the remaining week focusing on fixing drawings and creating visuals to be used in the final presentation and review of their project. The concerns and doubts noted by member A and C center around this and stress the importance of the visuals in properly presenting their design to the 'client.'

Photo 8: Week 3 Site Plan

Photo 9: Land Use Diagram

Photo 10: Street Elevation of 13th Street

Photo 11: Street Elevation of Muhammad Ali Blvd

Photo 12: Perspective of the entrance to Beecher Terrace at Liberty Street.

Photo 13: Overhead perspective of the Beecher Terrace redesign.

Tools/Mediums Used

As is the case in all design fields, sketches are an incredibly valuable asset in communicating ideas to people. This architecture group project was no exception, and as noted in every group member's diary, sketches were used heavily in the early stages of the design process to bridge the gap between the ideas of each individual group member. According to the group member entries, sketching pervaded the design communication between the members and the professor throughout the first week and extended into the second.

After the first week, the group began to work more heavily in 3D computer modelling applications (Sketchup). This allowed them the ability to create full three-dimensional shapes that could then be used for scaling, shadow studies, and guides for how best to place the housing. These applications have become a staple within the architecture and industrial design community to discover the special implications, limitations, and possibilities that an object or building may have. "Three-dimensional models can be used by design teams to communicate design intent to client and users and to compare and evaluate design options"; in the later stages of the design process, these models become equally important in the documentation process (Bouchlaghem).

Design Thinking

A valuable source that appeared later in the research for this paper has been *Design Thinking* by Nigel Cross. In it, the author attempts to document and describe the wide spectrum of topics that relate to how designers think and work. He looks at famous designer's accounts of how they formulated certain designs throughout their lifetimes, but more interestingly, Cross sheds light on the design process of individuals as well as groups. Many of the studies conducted

were that of short a time frame and relatively small in scale, and as such work as an augmented source to the findings of the research discussed above.

In a group study analyzed by Cross, a group of three was tasked with designing an add on frame to a mountain bike that could hold a specific line of backpack; this task was to be completed within the time span of two hours. The aim of the rack was to be sold as an add on that worked best with the specific backpack.

The findings turned out to be very similar to those of this paper's primary study, as well as what is known generally about designers. Each member of the group focused on different tasks and viewed the project rather differently. While one was very strict and focused on designing to the original prompt, another felt very open to explore other possibilities and possibly open the rack to other backpacks if the opportunity arose (Cross 117). This is not unlike that of the relationship between group members A and B in the architectural student study. While member B wished to focus on the details of the building – or the façade's appearance, member A worried more about how the entire site was designed first, and only after turned to detail work. The researchers also pointed out that the two widely different personalities and design processes of the members of their study used "the support of neutral parties such as common sense, higher principles or theories, and expert or standard practices to support their opinions" (Brereton), and this is likely what group members A and B used to resolve their conflicts as well.

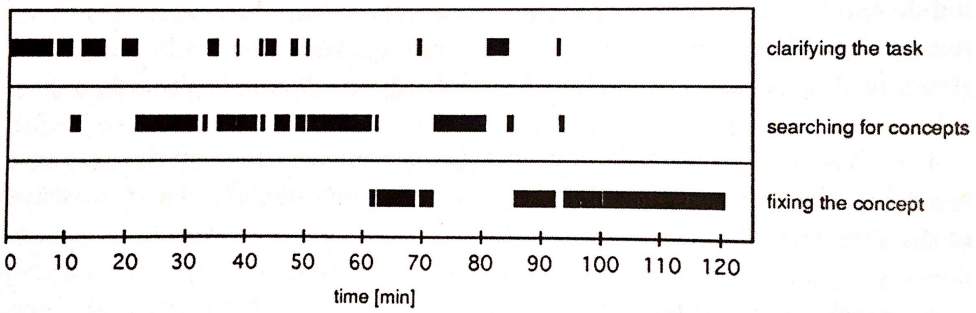
There were a few aspects of Brereton's research that are interesting, and act as another key item to be thinking about when studying the design process of groups. These aspects are noted in this study due to the time frame the project was done in, and thus were unable to be recorded properly on the time scale of the conducted study. The first item of note was the roles that were discovered within the group study. Each member focused on specific tasks, ranging from timekeeper and arbiter, to theorist or bike expert (Cross 118).

Table 7.2 Different roles adopted by the three designers.

Ivan	*John*	*Kerry*
Whiteboard manager Arbitrator Timekeeper – keeps the team on track	Theorist: abstracts process from context Uses process rationale as commentary to keep team on track	Bike expert and user advocate Seeks out context and detailed knowledge Seeks to ground the design with specific solution alternatives

These were obviously shaped by the background of each individual, and unsurprisingly the bike expert was the one designer who frequently spent his time mountain biking. This helps illustrate the importance for each member to focus on separate tasks. It is no use to a group for all of its individuals to be designing/thinking in the same way or focusing on the same tasks; productivity would quickly be lost in this method. The other intriguing aspect of Brereton's study is how it was able to document the time spent by the group on various tasks. The group of researchers roughly narrowed down the events of the project into three categories: clarifying the task, searching for concepts, and fixing the concept. Or in architecture school: research, preliminary design, and design development. The results were something to which only designers can really relate.

The researching portion is ever present and intermittent; instead of simply researching all at once, the designers continually come back at phases to reinforce or reevaluate their



7.1 Principal phases of the team's design process.

understanding of how their design might work. This is a constant philosophy of design that is taught in school, and Cross notes that senior industrial design students who used this method turned out to be more successful than those who researched heavily first (Cross 121). Likewise, the table shows a bit of time where it seems that the group may have discovered a concept to fix, only to return to search for better concepts at a later timeframe. This process of forward, backward, and forward movement is part of what makes design so hard to track and so frustrating at times.

Conclusion

The field of design work – of any type, is an incredibly complex and multifaceted grouping of disciplines. The process it uses for success is unknowable and ever changing, yet it persists vibrantly in a world that strives for right and wrong – order out of chaos. Because of this, there is a constant desire to study and understand how designer's think and create. Yet research is still limited on the subject; it is extremely difficult to gather data in a non-empirical way that can accurately describe what a designer accomplishes during a design session. There are many factors that limit the ability to properly gather noteworthy data. Design centers around humans and their way of thinking, and as such studying them is inherently unreliable; human activity is nonreplicable and finicky. Design is further complicated with the complex relationships each

individual has with their respective design groups. Rarely do people work alone in design fields anymore, and each individual contributes to the whole. Every individual's background impacts a design and morphs its path to completion. The discourse of this paper has been to shed light on how exactly these individuals impact the solution of a design problem. Each member has a view to share and an experience to communicate. These views and experiences mesh with those of each individual, and only after this has occurred will a design product be completed. This paper has become a demonstration for design students, faculty, and professionals on how important their individual contributions to the field shape the products and spaces that are created every day.

Researcher's Notes

The result of this paper has been a study in what many design researchers deem are key aspects of a successful process. While there are many schools of thought on what a design process should include and how best to structure time, this research hopefully helps depict the randomness of the design process. Much of the resources used throughout this paper agree that each designer thinks in his or her own way, and that it is up to each designer to form his or her own process. Thus, although you may not think or design in a way that mimics those discussed in this paper, this does not mean you are inherently a bad designer. Of the sources discussed throughout this project, two books were of great help in explaining this: the first is *Design Thinking* by Nigel Cross, and the second is *Developing Your Design Process – Six key concepts for studio* by A. Smith and K.S. Smith. The later of which helped explain various aspects of the design process with examples and stories about how they might relate to students. For those who look to continue their understanding of the design process, these books can be of great help.

Resources

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